which can be supported by a reference to this volume, must have much weight, and can never be justly treated with contempt.

In conclusion we must again express our sense of the admirable way in which Dr. Reese has edited the volume—and when we add that it is issued in the best style of its well known publishers, and clothed in the attractive half Russia binding, recently adopted by them, we feel that we have said enough to commend it to the attention of our readers. S. A.

ART. XXXVII.—*Traité de Chimie Biologique.* Par M. AD. WURTZ, Membre de l'Institut, etc. Part I. Paris: G. Masson.

Treatise on Chemical Biology. By AD. WURTZ.

THIS book, the first part of which has recently appeared, gives in extension the lectures delivered by the author in the Faculty of Medicine of Paris. Its aim is to trace, as far as possible, the complex organic compounds elaborated by vegetables from mineral matters, through the various transformations which they undergo in the animal body, until they are finally destroyed and again returned to the air and soil.

It is written in M. Wurtz's clear and vigorous style, so that the average student may read with interest, subjects for the comprehension of which an extended knowledge of chemistry would be required. We give some abridged extracts.

After describing the various properties of chlorophyl, by which plants are enabled to decompose and derive nourishment from carbonic acid gas and water, the philosophy of this property is thus summed up.

> "Chlorophyl in solution differs essentially from solid chlorophyl, such as is contained in living plants, by the absence, in the latter, of the fluorescence which characterizes the former; the absorption of light being the same in both kinds of chlorophyl, it may be said that there is an excess of radiation, and consequently of energy, in the chlorophyl in solution which is inactive physiologically. While it lives and acts in the living leaf, the chlorophyl can expend this excess of energy, and can, in the form of affinity, transfer to the atoms of carbon and oxygen, set free from the carbonic acid, the energy existing in the form of vibratory movement in light rays."

The energy thus derived from the sun by plants is expended by animals in the form of heat and motion.

> "The respiratory combustion would communicate to the organism a quantity of heat superior to that which is really manifested in any given time. This excess of energy is exerted in another form. It is consumed in the voluntary and involuntary movements made by the animal. It is converted into mechanical force. Modern physics regards the heat of any body as a mode of motion of its molecules, and it may be conceived that the sum of the individual motions of the molecules, the effect which we call heat, can be transformed into one movement of the mass."

The albuminoid bodies are well described in about one hundred pages. Many of the described varieties of albumen are shown to depend probably —certainly in some cases—on imaginary differences. The classification of the albuminoid bodies here adopted seems remarkably clear and well arranged. The bodies are classed as follows: soluble albumen and serine (serum albumen); coagulated albumen; fibrin; globulines, including fibrinoplastic matter, fibrinogen, myosin, vitellin, and casein; syntonines, including albuminose, produced by the action of alkalies on albumen, and acid-albumen, produced by the action of acids. Naturally, the first physiological process considered is digestion, and the alterations in the aliments are traced from the saliva until the debris is finally rejected in the excrements.

Of the gastric juice, M. Wurtz's says:—

> "It is thus clearly proved that the acidity of pure and fresh gastric juice is due to hydrochloric acid. It is not so with old gastric juice, or with that which is mixed with food. In the latter, lactic acid is frequently found, as has long since been shown by Leuret and Lassaigne. Lehmann found this acid in the gastric juice of dogs which had been fed only on bones. In cases of bad digestion, the gastric juice has been found to contain even volatile fatty acids, such as acetic and butyric acids. It is evident that these acids are the product of anomalous fermentations which take place pathologically in the stomach. The lactic acid undoubtedly results from a fermentation which occurs normally after the ingestion of certain aliments, or where the gastric juice is allowed to become old. . . . . . It may be demanded by what reaction hydrochloric acid is formed in the gastric juice. It results, doubtless, from the decomposition of sodium chloride, and the presence of this acid in the stomach must be related to the alkalinity of the blood. The agent and locality of the decomposition of sodium chloride cannot as yet be determined; we know, however, that the formation of pepsin is independent of that of hydrochloric acid, and that the latter appears in the stomach under the influence of an irritation of the mucous membrane. Pepsin fills the deeper parts of the tubular glands, and these parts are throughout neutral to litmus paper. The acidity appears only in the excretory duct, and it seems that the pepsin is dissolved and carried out by the intervention of the acid, although it cannot be said that there is a veritable combination of the pepsin and hydrochloric acid as was supposed by C. Schmidt."

The role of the bile in digestion is thus summed up:—

> "The bile is capable of dissolving a certain quantity of fatty acids, such as palmitic acid, and even a small quantity of neutral fats. It may so contribute, at least in a measure, to emulsify fatty bodies throughout the intestinal tract. It is shown by the experiments of Bidder and Schmidt and Wistinghausen that oil rises higher in capillary tubes when the latter have been wetted with bile, and also that emulsified fatty bodies pass more easily and with less pressure through animal membranes when the latter are permeated with bile. . . . . . It results that the bile may assist in the division and absorption of fatty matters, but, as far as the digestion of albuminoid matters is concerned, it is impossible to attribute to it a role analogous to that of pepsin or the pancreatic ferment.

. . . .

> "It is not certain that the *stercorine*, described by Flint, and extracted by him from the excrements, is a well-defined substance. It was obtained in fine needle-shaped crystals, and is coloured red by sulphuric acid. The latter property relates it to cholesterin with which it may be identical, for the method employed for its extraction would apply also to cholesterin. The presence of a small quantity of neutral fats would sufficiently explain the peculiar crystalline appearance and physical properties of the matter obtained, and the latter was not analyzed."

After giving a full history of the many theories which have been advanced and held with reference to the coagulation of the blood, M. Wurtz concludes:—

> "It results from this long exposition of the phenomenon of the coagulation of the blood, that notwithstanding the many labours of which that phenomenon has been the object, it is far from being explained, at least inasmuch as concerns the chemical reactions which determine and accompany it. It was formerly supposed that the blood and other spontaneously coagulable liquids contain fibrin in solution, and that the latter becomes insoluble when it leaves the organism. It is now held

that these liquids contain a principle, fibrinogen, capable of generating fibrin; that this principle alone is incapable of being converted into fibrin, and that it coagulates only by the influence of one or more other matters, furnished either by the white corpuscles or by the hæmatoblasts. The question has thus been contracted, but is not as yet resolved."

M. Wurtz does not accept the theory of Schmidt, that fibrin is the result of the union of two substances, fibrinogen and paraglobulin, and rejects the recent theory of Mathieu and Urbain, based upon the action of the carbonic acid gas contained in the blood. He rather inclines to the idea of Mantegazza, that the coagulation is due to a peculiar condition of the white corpuscles, brought about by the presence of a foreign body or inflamed tissues, and by virtue of which they disengage a substance which causes the formation of fibrin, most probably by acting on the fibrinogen contained in the plasma.

The book concludes with the study of the blood. The various methods for the analysis of blood are fully considered, but the directions given for the examination of suspected blood-stains are rather meagre; the latter question hardly falls within the limits of biological chemistry, yet it seems that more than a page and a half might have been devoted to its consideration.

W. H. G.

ART. XXXVIII.—*Ovariotomy in Italy.* 1. *La Prima Centuria d' Ovariotomie in Italia.* Per Dott. DOMENICO PERUZZI. Lugo, 1878. 2. *La Secunda Centuria*, etc., 1880.

The First and Second Hundred Ovariotomies in Italy, with Statistical Tables and Practical Considerations. By Dr. D. PERUZZI, of Lugo. 8vo., pp. 71 and 39. Extracted from the *Raccoglitore Medico*, series 4, vol. x., n. 2, 3, 4, and vol. xiii., n. 7, 8.

THESE two monographs are evidences of the patient and persevering researches of one who occupies a very distinguished position as an ovariotomist, both from the proportionate number of his cases and his success in their treatment. Of the first hundred operations he performed twelve, and saved seven of the women; and of the second hundred nine, and saved also seven, showing a decided improvement in results.

Ovariotomy was introduced into Italy in 1859, the first operation having been performed by Prof. Vanzetti, of Padua, on March 26th of that year; the patient died of peritonitis. He operated again in 1860 with the same result; and Dr. Peruzzi followed him, in 1865, with the third case also fatal. Vanzetti persevered in the operation until in a period of sixteen years he had had eight cases, all fatal. The first non-fatal case in Italy was the tenth, and in the tenth year of the operation, September 26, 1868. The fortunate operator was Prof. Landi, of Pisa. The cyst was small, unilocular, and non-adherent; and the pedicle was treated by cauterization, being the first so managed. Up to this time the long ligature had failed in three cases; the clamp in two; ligature and transfixing-pin in one; and in one the pedicle was ligated with wire and dropped in. Dr. Peruzzi followed with a successful case on March 4, 1869, in which he used the clamp. These two successes added to the hopes of the operators, so that there was in a few years a large increase of cases treated by the knife. From 1859 to 1872 there were 15 operations, with three women